



CASE STUDY

NASA Jet Propulsion Laboratory, Phase II

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About the Project

After the completion of CEG Solutions (formerly Clark Energy Group) (CEG) first ESPC project at NASA's Jet Propulsion Laboratory (JPL), NASA awarded CEG a \$25.7MM contract for a second ESPC project at the laboratory. The project's scope includes renewable energy, water conservation, and energy efficiency measures and involved upgrades to 128 buildings that housed data centers, laboratories, offices, command facilities, support services, cafeterias, shops, and testing facilities. Although NASA had previously performed a wide range of upgrades to its energy-consuming systems on campus, the measures that have been installed as part of CEG's Phase II project are expected to reduce water consumption by 18 million gallons per year, electricity consumption by 5.6 million kWh per year, and total energy consumption by 23.9 Billion Btu per year. Construction was completed in March 2015.

CEG took a comprehensive approach to the project and identified a wide array of ECMs to drive deeper savings and improve overall building performance. CEG upgraded building controls, implemented VFDs on pumps, replaced chillers, replaced inefficient light fixtures in areas requiring extensive containment of asbestos, upgraded irrigation across the entire 177-acre campus, improved the building envelope in over 100 buildings, retrofit domestic water fixtures, reduced electric load,



CLIENT

NASA Jet Propulsion Laboratory

LOCATION

Pasadena, CA

YEAR

2013-2015

AWARD

2016 Federal Energy and Water Management Project Award by DOE FEMP

FINANCIAL

Project Cost:
\$24,570,439

Total Rebates/Incentives:
\$544,195

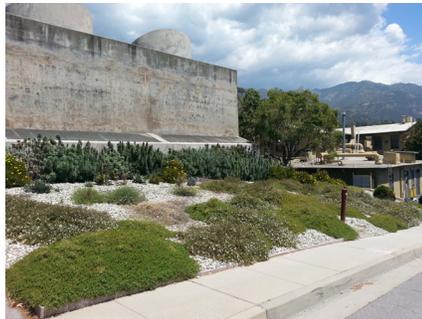
Net Cost After Incentives:
\$24,026,244

ESTIMATED SAVINGS:
\$36,400,000

Simple Payback:
17.4 Years

CONTINUED

and implemented mechanical upgrades to major central plants. The project was later expanded to include the installation of a 273 kW rooftop solar PV system. The project required CEG to perform upgrades to MEP systems serving mission critical data centers and laboratories. In some cases, CEG worked closely with JPL staff to provide backup temporary chillers and generators in situations where temporary disruptions or plant outages would have disrupted critical operations.



ABOUT THE LOCATION

NASA JPL is a government-owned, contractor-operated (GOCO) facility that is managed by the California Institute of Technology (Caltech) for the National Aeronautics and Space Administration (NASA). The laboratory's primary function is the construction and operation of robotic planetary spacecraft, though it also conducts Earth-orbit and astronomy missions.

ENERGY CONSERVATION MEASURES

- Rooftop Solar Photovoltaic System
- Building Envelope & Weatherization
- Compressed Air System Optimization
- Domestic Water Upgrades
- LED Lighting Upgrades
- Spectrally Enhanced Lighting
- Chiller Replacements
- Night Setback and Controls Upgrades
- Variable Frequency Drives
- Pump Upgrades
- Retro-commissioning
- Irrigation Improvements
- Ground-Water Harvesting
- Upgrades to Reverse Osmosis (RO) Water System
- Plug Loads
- Window Film

PROJECT HIGHLIGHTS

- **Annual Savings over \$725,000**
- **Water Savings of 18 Million Gal./year**
- **Upgrades in 128 Bldgs. & Laboratory ECMs**
- **Electricity Savings of 5.6 Million kWh/year**
- **Gas Savings of 7.6 Billion Btu/year**
- **Energy Savings of 23.9 Billion Btu/year**